Warm Up # 10-1

1. In a class of 40 students, 19 play team sports, 20 run track and 8 do neither. Find the probability that a student randomly chosen from this class

a) plays team sports

b) does not run track

c) does at least one of these

d) plays team sports, but doesn't run track

e) does only one of these

HW Questions:

Answers are after the HW slide.

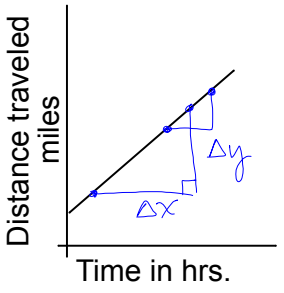
Review Rates of Change

A comparison between 2 different types of quantities

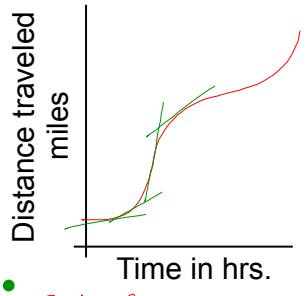
Example: points per game

inches of rain per day

miles per hour



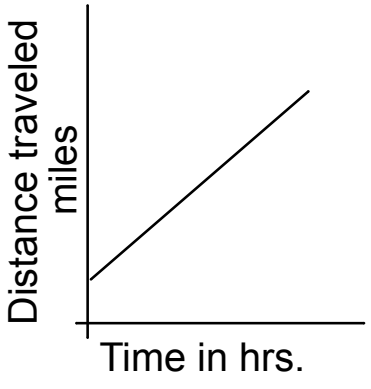
constant rate of change

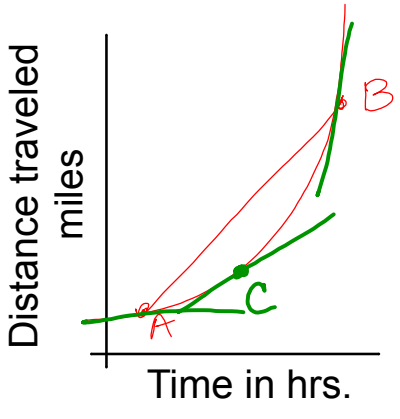


Rate of change is changing

Average Rate of Change = $\frac{\Delta y}{\Delta x}$

slope between 2 points





Instantaneous Rate of Change

The rate of change at a particular point

This rate of change = slope of the tangent line at that point.

Introduction to Differential Calculus

Vocabulary:

Gradient → Slope → $\frac{\Delta y}{\Delta x}$

Derivative → Rate of change anywhere on the curve, which = slope of the tangent line at any point on the curve.

Differentiation

The process of finding the derivative.

Differentiation

$y = ax^n$

Derivative: $y' = a \cdot n x^{n-1}$

Slope of tangent

$y = 2x^1$

$y' = 2(1)x^{1-1}$

Example: $y = 2x$ $y = x^2$

$y' = 2x^0$

$y' = 2$

$y' = (1)(2)x^{2-1}$

$y' = 2x$ @ $x = -1$ slope $= -2$

$y = 2x + 5$

$y' = 2$

@ $x = 0$ slope $= 2(0) = 0$

@ $x = 2$ slope $= 2(2) = 4$

For tonight's homework:

Formal Laws of Probability

Addition Law → $P(A) + P(B) - P(A \cap B) = P(A \cup B)$

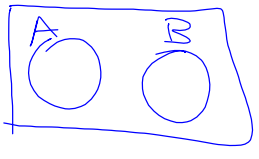
$A \cap B$: intersection — Both A and B

$A \cup B$: Union — Either A or B or both

Mutually Exclusive = Disjoint

A & B have no elements in common

$P(A \cap B) = 0$



$P(A) + P(B) = P(A \cup B)$

HW: 9I p. 290, # 1 - 5

HW Quiz tomorrow:

9F p. 279

9F p. 280

9G.2 & 9G.3, p. 284-285

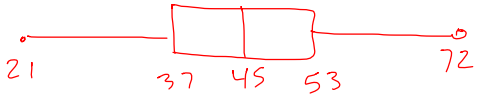
Rev. Set 9B p. 296

Answers to IB Test Practice (2008 paper 1)

2. a) 45

b) 16

c) box plot



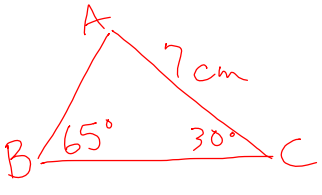
10a) 29.7675

b) ≈ 30

c) ≈ 0.781%

d) 7.81×10^{-1}

7. a)



7b) AB ≈ 3.86 cm

c) Area ≈ 13.5 cm^2

5a) variables are independent. (detail complete sentence)

b) $df = (3-1)(3-1)$
$= 4$

c) $\chi^2 \approx 51.6$

d) $p \approx 1.71 \times 10^{-10}$

Since $p < 0.05$
we reject H_0

9a) Histogram bars are connected.

9b) $3800 \leq w < 4000$

c) $\frac{3}{35} \approx 0.0857$